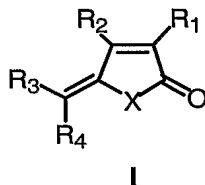


## CLAIMS

1. An antimicrobial silicone oligomer or polymer comprising a silicone oligomer or polymer associated with at least one compound of formula I



- 5        wherein, R1 and R2 are independently selected from the group consisting of H, halogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl whether unsubstituted or substituted, straight chain or branched chain,
- R3 and R4 are independently H, halogen, alkyl, aryl, or arylalkyl; and
- X is O or NR<sub>2</sub>.
- 10    2. A antimicrobial silicone oligomer or polymer according to claim 1 wherein R1 and R2 of the compound of formula I are independently hydrophobic, hydrophilic or fluorophilic.
3. An antimicrobial silicone oligomer or polymer according to claim 1 or claim 2 wherein at least one of R1, R2, R3 and R4 is a halogen.
4. An antimicrobial silicone oligomer or polymer according to claim 3 wherein at least
- 15    one of R1, R2, R3 and R4 is bromine.
5. An antimicrobial silicone oligomer or polymer according to any one of claims 1 to 4 wherein the compound of formula I is blended or mixed with the silicone oligomer or polymer.
6. An antimicrobial silicone oligomer or polymer according to any one of claims 1 to 4
- 20    wherein the compound of formula I is adsorbed to the silicone polymer or oligomer.
7. An antimicrobial silicone oligomer or polymer according to claim 6 wherein the compound of formula I is adsorbed to the silicone polymer or oligomer by direct application of the compound of formula I to the silicone polymer or oligomer.

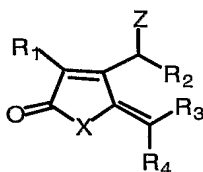
8. An antimicrobial silicone oligomer or polymer according to any one of claims 1 to 4 formed by copolymerising a compound of formula I with at least one silicone comonomer or oligomer and optionally at least one other monomer.

9. An antimicrobial silicone oligomer or polymer according to any one of claims 1 to 4  
5 formed by condensation polymerisation of a silicone monomer or oligomer or polymer with the compound of formula I.

10. An antimicrobial silicone polymer or oligomer according to any one of claims 1 to 4 formed by surface attachment of a compound of formula I on to a silicone polymer or oligomer or a device formed at least in part therefrom.

10 11. An antimicrobial polymer or oligomer according to claim 10 wherein the silicon polymer or oligomer or the device is chemically or plasma treated.

12. An antimicrobial silicone oligomer or polymer according to any one of claims 1 to 11 wherein the compound of formula I is a compound of formula II



II

15 wherein  $R_1$ ,  $R_2$  are independently selected from H, alkyl, alkoxy, polyethyleneglycol, oxoalkyl, alkenyl, aryl or arylalkyl whether unsubstituted or substituted, straight chain or branched chain;

$R_4$  is a hydrogen, halogen ( $X = F, Cl, Br$  or  $I$ );

$R_3$  is hydrogen or halogen; and

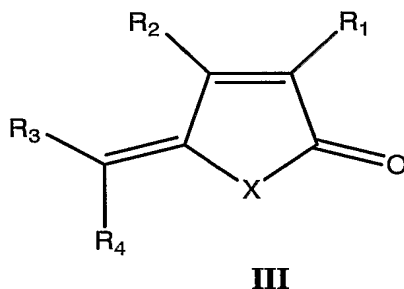
20 X is O or  $NR_2$  and

Z is independently selected from the group  $R_2$ , halogen, OH, OOH,  $OC(O)R_2$ ,  $=O$ , amine, azide, thiol, mercaptoalkyl, mercaptoalkenyl, alkenyloxy, aryloxy, mercaptoaryl, arylalkoxy, mercaptoarylalkyl,  $SC(O)R_2$ ,  $OS(O)_2R_2$ ,  $NHC(O)R_2$ ,  $=NR_2$ ,  $NHR_2$  or silyloxy.

13. A antimicrobial silicone oligomer or polymer according to claim 12 wherein R1 and R2 of the compound of formula I are independently hydrophobic, hydrophilic or fluorophilic.

14. An antimicrobial silicone oligomer or polymer according to any one of claims 1 to 13 wherein the silicone oligomer or polymer is selected from the group comprising hexamethyldisiloxane, octamethyltrisiloxane, decamethyltetrasiloxane, dodecamethylpentasiloxane, tetradecamethylhexasiloxane, hexamethyltricyclosiloxane, decamethylpentacyclosiloxane, dodecamethylhexacyclosiloxane, and dimethylpolysiloxane.

15. A compound of formula III:



wherein, R1 and R2 are independently selected from the group consisting of H, halogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl whether unsubstituted or substituted, straight chain or branched chain,

R3 and R4 are independently H, halogen, alkyl, aryl, or arylalkyl; and

X is O or NR<sub>2</sub>,

wherein the compound of formula III has at least one -YC(O)NR<sub>7</sub>R<sub>5</sub>Si(OR<sub>6</sub>)<sub>3</sub> group, where Y is selected from the group O, S, N, P, C(O); R<sub>5</sub> is a linker and preferably is substituted or unsubstituted alkyl, alkylaryl, arylalkyl, aryl, alkenyl, or a linker comprising these groups, optionally interrupted by one of more heteroatoms (eg oxygen), or a linking group comprising these groups and each R<sub>6</sub> is independently selected from substituted or unsubstituted alkyl, cycloalkyl, alkenyl or the like and R<sub>7</sub> is H or alkyl.

16. A compound according to claim 15 wherein the linker R5 is a polyoxoalkylene.

17. A antimicrobial silicone oligomer or polymer according to claim 1 wherein R1 and R2 of the compound of formula I are independently hydrophobic, hydrophilic or fluorophilic.

18. A method of producing a compound according to formula III of anyone of claims 15 to 17, comprising reacting a compound of formula I having at least one group selected from –  
5 Y'-H, wherein –Y' is selected from the group O, S, NH, COO with a compound of formula  $\text{OCNR}_7\text{R}_5\text{Si}(\text{OR}_6)_3$ , wherein R<sub>5</sub> is a linker and preferably is substituted or unsubstituted alkyl, alkylaryl, arylalkyl, aryl, alkenyl, or a linker comprising these groups, optionally interrupted by one of more heteroatoms (eg oxygen), or a linking group comprising these groups and  
10 each R<sub>6</sub> is independently selected from substituted or unsubstituted alkyl, cycloalkyl, alkenyl or the like and R<sub>7</sub> is H or alkyl.

19. A method for associating a compound of formula III of any one of claim 15 to 17 with a surface, the method comprising contacting the compound of formula III with the surface and optionally curing the compound.

20. A method according to claim 19 wherein prior to the step of contacting the  
15 compound of formula III with the surface, the surface is treated to produce groups that are reactive with the silyloxy group of the compound of formula III.

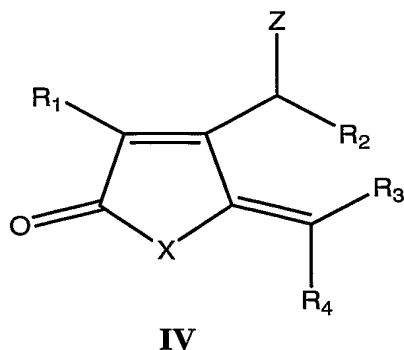
21. A method for associating a compound of formula III according to any one of claims 15 to 17 with a polymer or oligomer; the method comprising contacting the compound of formula III with the surface and optionally curing the polymer or oligomer.

20 22. A method according to claim 21 wherein the polymer or oligomer is a silicone polymer or oligomer.

23. A polymer or oligomer associated with a compound of formula III according to any of claims 15 to 17.

24. A polymer or oligomer of claim 23 wherein the polymer or oligomer is a silicone  
25 polymer or oligomer.

25. A compound of formula III according to any one of claims 15 to 17 wherein the compound is of formula IV:



10 wherein  $R_1$ ,  $R_2$  are independently selected from H, alkyl, alkoxy, polyethyleneglycol, oxoalkyl, alkenyl, aryl or arylalkyl whether unsubstituted or substituted, straight chain or branched chain;

$R_4$  is a hydrogen, halogen ( $X = F, Cl, Br$  or  $I$ );

$R_3$  is hydrogen or halogen; and

$X$  is O or  $NR_2$  and

15  $Z$  is independently selected from the group  $R_2$ , halogen, OH, OOH,  $OC(O)R_2$ ,  $=O$ , amine, azide, thiol, mercaptoalkyl, mercaptoalkenyl, alkenyloxy, aryloxy, mercaptoaryl, arylalkoxy, mercaptoarylalkyl,  $SC(O)R_2$ ,  $OS(O)_2R_2$ ,  $NHC(O)R_2$ ,  $=NR_2$ ,  $NHR_2$  or silyloxy;

20 wherein the compound of formula IV has at least one  $-YC(O)NR_7R_5Si(OR_6)_3$  group, where  $Y$  is selected from the group O, S, N, P,  $C(O)$ ;  $R_5$  is a linker and preferably is substituted or unsubstituted alkyl, alkylaryl, arylalkyl, aryl, alkenyl, or a linker comprising these groups, optionally interrupted by one of more heteroatoms (eg oxygen), or a linking group comprising these groups and each  $R_6$  is independently selected from substituted or unsubstituted alkyl, cycloalkyl, alkenyl or the like and  $R_7$  is H or alkyl.

25 26. A device coated with a compound of formula III according to any one of claims 15 to 17 or with a compound of formula IV according to claim 24.

27. A device according to claim 26 wherein the device is a contact lens.

28. A device according to claim 26 wherein the device is a catheter.
29. A device according to claim 26 wherein the device is a separation membrane used for water treatment.
30. A device according to claim 26 wherein the device is a bandage.
- 5 31. A device according to claim 26 wherein the device is an alginate bead.